

# the WATER HAULER'S BULLETIN

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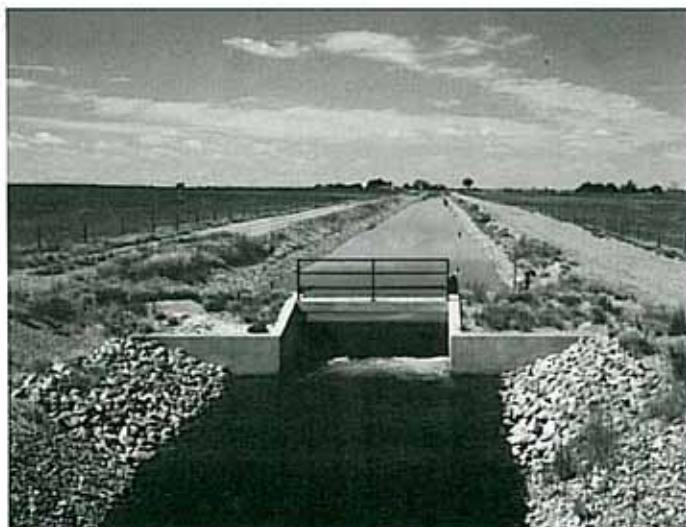
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## Maintenance Guidelines Nearing Completion

**A**s part of the long-term Irrigation Rehabilitation Program (IRP) report and recommendations adopted in November of 1995, the irrigation districts and the irrigation branch of Alberta Agriculture, Food and Rural Development (AAFRD) were charged with the responsibility of developing "a standard set of maintenance guidelines" for use by all districts. "A committee," says Len Ring, manager, irrigation secretariat "was formed with five district representatives and three branch representatives. A great deal of effort by all parties has been put into this project to date."

The committee soon agreed that the most effective way to evaluate the level of maintenance that was occurring in the districts was to develop a guideline on "how to rate the condition" of irrigation works rather than "how to do" maintenance. The result was a draft report entitled "Irrigation Works Condition – Evaluation Guidelines." The group felt that each dis-



*Well maintained irrigation canal.*



*an acceptable level of maintenance  
on irrigation works would be  
required in order to continue  
participation in the IRP*

trict could then use this document to evaluate the condition of their works and prepare a maintenance plan that met their own needs. The group also agreed that an acceptable level of maintenance on irrigation works would be required in order to continue participation in the IRP. This revised approach to maintenance would, rather than suggest how things are done, address more the issue of what the end result of good maintenance should look like.

"The document" says Ring "examines various types of works common in irrigation districts." For each component, the report shows examples of a good, fair or poor state of condition. In addition, procedures are outlined for random inspections of each district and reporting procedure to be used by the irrigation branch.

A requirement for irrigation districts to prepare and submit to Irrigation Council a "simple written maintenance report" on an annual basis also forms part of the long-term IRP recommendations. As a result, the working group included in their report a suggested format for the irrigation districts to use when preparing this report.

The draft "Irrigation Works Condition – Evaluation Guidelines" document was reviewed by the Maintenance Guidelines Steering Committee and presented to Irrigation Council at the December 12, 1996 Council meeting. Council examined the document in detail at its January 1997 meeting and made suggestions for consideration by the committee prior to finalizing the document. It is anticipated that the document will be revised and submitted to the irrigation districts for ratification. Then the final document will be submitted to Irrigation Council for approval. "Irrigation Council" stated Ring "was very pleased with the result of the working group's efforts and is confident that the final document will form an effective base from which the irrigation districts can plan their maintenance activities to ensure the long-term viability of the irrigation infrastructure."

Irrigation Council and the irrigation secretariat would like to commend all those involved in the preparation of these procedures and guidelines. This document is being created with a great deal of effort by all members of the committee and Council is particularly pleased with the role that the irrigation districts have played in this process.

For further information contact Len Ring, Manager, Irrigation Secretariat, telephone (403) 381-5176 or Zafar Iqbal, Irrigation Branch, telephone (403) 381-5173. ■

## A Machine That Makes A Difference

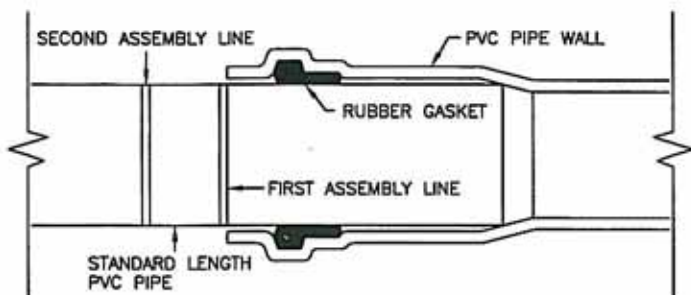
**W**hen installing PVC pipe there are a number of methods that can be used. Two methods that have been used ever since pipe was first installed has been to push the pipe together with a backhoe or use a "come-along" to pull the pipe together. A new method has come upon the scene, although it has already been in use by a few of the irrigation districts, is a hydraulic pipe puller.

In October 1996, the Lethbridge Northern Irrigation District (LNID) commenced construction on the Albion Ridge Project. It involved the installation of approximately 42,000 metres of PVC pipe, ranging in size from 200 mm to 900 mm in diameter. "We specified that the contractor use a hydraulic pipe puller for assembly of joints on pipe over 400 mm in diameter," states Lawrence McCune, senior technologist with LNID.

The pipe puller has several advantages over other methods:

- more control in pipe assembly than when pushing with an excavator bucket.
- quicker and cleaner than using a "come-along."
- contractor has fewer joints to make, and does not need to delay the excavators.
- able to save on the amount of pipe required on the project.

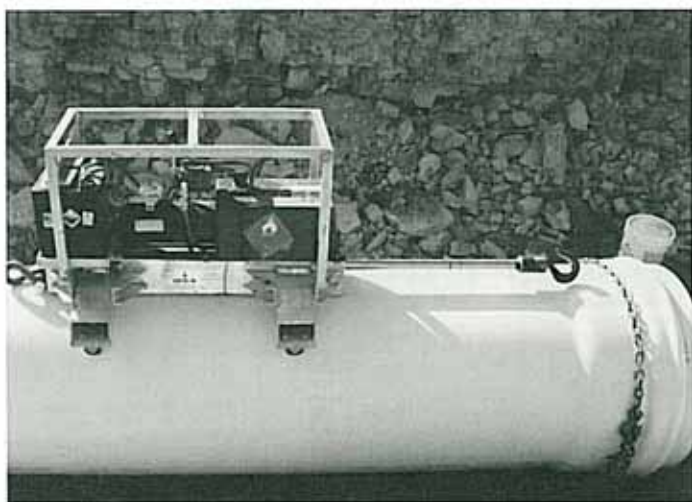




Two assembly lines appear on large diameter pipe.

- able to stop consistently at the first assembly line.

Being able to lay each pipe length "consistently" to the first assembly line (6.10 m - total pipe length) as opposed to the second assembly line (6.08 m - total pipe length) can make a significant difference. "That is only a 0.33% difference" states McCune, but on a large project the size of Albion Ridge the savings were substantial. We had 27,000 metres of pipe over 400 mm in diameter, so we saved approximately 90 metres of pipe. "If the average price of 450 mm to 900 mm diameter PVC pipe was \$160/m then our savings would be \$14,400," says McCune.



Hydraulic pipe puller.

Hydraulic pipe pullers are available from IPEX for approximately \$2,000 and run on a 12 volt battery.

For more information, please contact Lawrence McCune, RET, Senior Technologist, Lethbridge Northern Irrigation District, 334 - 13 Street North, Lethbridge, Alberta, Canada, T1H 2R8. Telephone (403) 327-3302. ■

## Irrigation in the 21st Century

### Year 2000 Water Review

The South Saskatchewan Water Allocation Regulation set expansion limits on irrigation in the South Saskatchewan River Basin in 1991, with the understanding that these limits would be reviewed in the year 2000. To meet the irrigation industry's input to this review, the Alberta Irrigation Projects Association (AIPA) and the irrigation branch of Alberta Agriculture, Food and Rural Development (AAFRD) formed the "Year 2000 Steering Committee" in 1996. "The committee," says Stan Klassen, AIPA executive director, "wants to accurately determine current water use within the irrigation districts and calculate future demands." Shortly after its formation, the committee was expanded to include Alberta Environmental Protection (AEP) and the Prairie Farm Rehabilitation Administration (PFRA). This committee is co-chaired by Stan Klassen (AIPA) and Brent Paterson, head of the irrigation branch.

Klassen says, "The current information we have is simply not adequate for this important review, and we realized the need to develop new, scientifically sound data to determine existing water use within the irrigation districts. The data will also be analysed to predict future water requirements, taking into account improvements in canal rehabilitation, higher efficiency irrigation systems, changing crop types and new market opportunities."

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*"Cooperation between the working groups is excellent" says Klassen, "which is critical for a study of this size and complexity."*

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Three working groups were established to coordinate the collection and analysis of required data. Each working group is co-chaired by a representative from an irrigation district and the irrigation branch. Staff from the irrigation branch, the irrigation districts



*We are confident that this study will show the importance of irrigation water to Alberta's agricultural economy, and assist irrigation districts manage their water supplies*

and PFRA work together on the planning and implementation of all projects related to this study. Outside consultants are hired to carry out specialized assignments.

#### **On-Farm Water Use**

This group's responsibility is to: identify existing on-farm management of irrigation water; determine water requirements for various crops; identify water savings resulting from more efficient irrigation systems and management; and assess the risk and impact of water shortages on irrigation farmers and secondary industry.

#### **Distribution System Efficiency**

This working group is carrying out detailed monitoring of canals (rehabilitated and unrehabilitated) and pipelines to determine the amount of the diverted water which is: used by farmers; lost through seepage and evaporation; and returned to the river. This group will also assess water savings resulting from changes in management and canal rehabilitation.

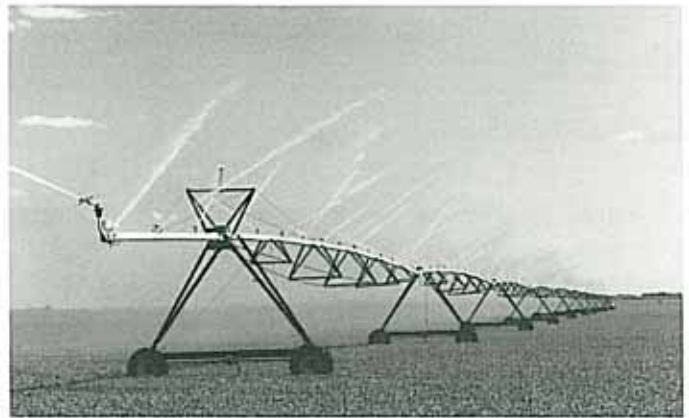
#### **Computer Modelling**

This working group will use the information obtained by the On-Farm and Distribution groups to reliably predict future water allocation requirements and develop operational management strategies.

Over the past year the working groups have initiated a number of studies in support of this study. "Cooperation between the working groups is excellent," says Klassen, "which is critical for a study of this size and complexity." Results from these projects will be presented to the Year 2000 steering committee this April.

"This is one of the most important and challenging studies ever undertaken for Alberta's irrigation industry" says Klassen. "We are confident that this

study will show the importance of irrigation water to Alberta's agricultural economy, and assist irrigation districts manage their water supplies to the best advantage of the water users," concludes Klassen.



*Water – our precious resource.*

For more information regarding the work of the Year 2000 Steering Committee, please contact Stan Klassen, AIPA Executive Director, 909, 400-4 Avenue S, Lethbridge, Alberta, Canada, T1J 4E1. Telephone (403) 328-3063; or Brent Paterson, Head of the Irrigation Branch, AAFRD, Agriculture Centre, Lethbridge, Alberta, T1J 4C7. Telephone (403) 381-5140. ■

## **Water Wheel Awards**

**C**ongratulations to the four recipients of the Water Wheel award which were presented at the Alberta Irrigation Projects Association Annual Conference '96. This award is given to individuals for their dedication and contributions to the irrigation industry in southern Alberta. The four award winners are:

- |                      |  |
|----------------------|--|
| <b>Don LeBaron</b>   | – Lethbridge Alderman                                      |
| <b>Jim Brown</b>     | – Manager of St. Mary River Irrigation District            |
| <b>Keith Francis</b> | – Chairman of Taber Irrigation District Board of Directors |
| <b>Rick Ross</b>     | – Manager of Lethbridge Northern Irrigation District       |



# Care and Attention is Needed

## Using Acrolein for Aquatic Plant Control

**A**crolein (Magnacide H) is commonly used by several irrigation districts to control problem growth of aquatic plants and algae in canals. Rob Burland, biologist with Alberta Environmental Protection says "it can be used when irrigation season is in full swing without concern for effects or residues on irrigated crops." Acrolein is applied from a stationary point on the canal bank and allowed to drift downstream, contacting the vegetation for a fixed period of time. Although acrolein is short-lived in water and safe for irrigated crops, it is quite toxic to fish and certain aquatic invertebrates and is not registered for use in potable or livestock water supplies.

Acrolein must be applied by an applicator trained in its use and certified by Alberta Environmental Protection (AEP). Its use must also be conducted under an AEP Special Use Approval which prohibits its release into rivers, creeks, reservoirs, and dugouts used for potable or livestock water supplies. The Special Use Approval also sets notification and application conditions on its use so that the potential for adverse environmental or human health effects are minimized.

"When used according to approval requirements and as per manufacturers instructions, acrolein is an appropriate tool for aquatic plant control in irrigation canals," says Burland. The following news release from the Oregon Department of Fish and Wildlife, however, underscores the importance of using care and attention and following approval conditions and label directions when applying acrolein. It describes how an irrigation district in the state of Oregon was fined a total of \$406,407 for damages caused when the acrolein treated water was allowed to enter a creek and killing fish in a 4.5-mile stretch.

In addition to the \$356,000 damage assessment and the \$50,000 penalty mentioned in the news release, the irrigation district was also fined \$407 by the Oregon Department of Agriculture for allowing Magnacide H to enter into the Creek contrary to label



*Unsafe use of herbicide can result in fish kill.*

directions that prohibit allowing the herbicide to enter fish bearing waters.

**News Release - August 21, 1996**

## **U.S. Irrigation District Fined \$356,000 for Fish Kill**

Talent Irrigation District near Ashland has been billed \$356,000 in damages for killing an estimated 92,000 juvenile steelhead in May. The district errantly released a powerful chemical weed killer in a 4.5-mile section of Bear Creek, a Rogue River tributary, killing the fish.

The incident occurred when Talent Irrigation District personnel treated a section of an irrigation canal with acrolein, a herbicide highly toxic to fish. A leak in a headgate allowed the herbicide to enter



Bear Creek where the department says it killed all fish in a 4.5-mile stretch.

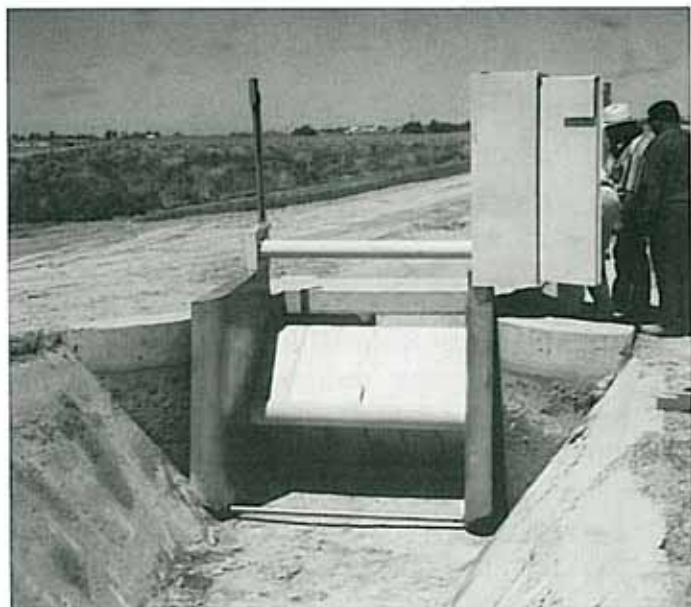
The department arrived at a damage assessment by using a model to determine how many steelhead were in the spill area at the time of the spill. That number included 35,000 juvenile summer steelhead, 57,000 juvenile winter steelhead and 102 juvenile coho. Biologists know what percentage of the juveniles would have returned as adults. Adult fish are valued statutorily at \$125 each.

By law, the damage assessment will be used for restoration work. The first priority for restoration is in the basin where the kill occurred - in this case, the Rogue River basin. The \$356,000 damage assessment is a separate action from a \$50,000 civil penalty levied against the irrigation district by the Department of Environmental Quality.

For more information please contact Rob Burland, Biologist, Pesticide Management Branch, Alberta Environmental Protection, Provincial Building, Lethbridge, Alberta, Canada, T1J 4C7. Telephone (403) 382-4015. ■

## Level Control with the Langemann Gate

**T**he Langemann gate, originally developed as a flow control device, has been on test since April 1996 in an upstream level control mode and has performed very well. As most readers are aware, a mini-revolution in irrigation canal operation has occurred in the past two decades with the introduction of the single-leaf overshot gate. Since 1980 when the first gate was designed by Joe Prozniak and installed by the St. Mary River Irrigation District in their main canal near Bow Island, Alberta hundreds of new and old check structures have been fitted with the overshot gate says Ken Craig, P. Eng. with Aqua Systems 2000 Inc. Southern Alberta engineers and Armtec Inc. have taken the concept literally around the world. Many of these gates are automated to further enhance the level control that is inherent in the overshot configuration. The Langemann gate and its unique low-cost controllers has added significant new



*Langemann gate and level controller.*

options for engineers and water managers in the quest for better control of an ever more valuable resource.

In volume 59, 1995 issue of the *Water Hauler's* we reported on the commercialization of the Langemann gate by Aqua Systems 2000 Inc. At that time there were a number of gates in the field using the unique controller developed by Peter Langemann to provide a constant flow of water from a major canal into a lateral or a farm turnout. Shortly thereafter, Mr. Langemann developed a similar controller for upstream level control.

The Imperial Irrigation District purchased the first of this type and installed it in a 1.4 CMS (50 cfs) lateral in their district in southern California. A datalogger and instrumentation to record water level, gate position, battery voltage and site temperatures were also installed. Data was recorded, initially on 5-minute intervals and currently on half-hour intervals continuously since commissioning in April. (Irrigation in southern California is a 365 days a year job, with no time off for good behaviour or "hard" water.)

While the gate and controller performed flawlessly, there were peripheral problems of an undersized solar panel, high summer temperatures and a need for a faster response when major flow increases were introduced. "Recent modifications included doubling the solar panel rating to 20 watts, heat shielding of the equipment cabinet and an independent high level assist circuit in the controller," states Craig.



A warning for those planning to use solar power: More sun is not necessarily better, high temperatures can degrade a solar panel output by as much as 60 percent. Panels that are quite adequate in Alberta don't get the job done in California.

Aqua Systems is very appreciative of the district's thorough data collection and their work with this prototype installation as development continues.

The algorithm used in the above discrete logic controller is currently being programmed into a programmable logic controller (PLC) for installation on the Sundial check in the Bow River Irrigation District's main canal.

For more information, please contact Ken Craig, P.Eng., Aqua Systems 2000 Inc., 1606 Lakeside Road, Lethbridge, Alberta, Canada, T1K 3G8. Telephone 1-800-315-8947. Email - aqua\_2000@upanet.uleth.ca ■

## Irrigation Information Available

**F**or the past five years Alberta Agriculture, Food and Rural Development, irrigation branch has compiled pertinent irrigation data into a booklet. The purpose of this booklet is to provide an overview of selected irrigation data relating to the thirteen irrigation districts in southern Alberta. Some of the information contained in this booklet includes:

- type and the total acreage of each crop grown within the thirteen irrigation districts. This data is presented in the form of a table with corresponding pie graphs for each district.
- assessed acres as well as irrigated acres within each district.
- South Saskatchewan River Basin Annual water diversions to each district.
- a list of each district's irrigation reservoirs and their total storage.
- a map showing all major irrigation works (canals 200 cfs and over) within the irrigation districts.

This booklet will be completed and available upon request at the end of April, 1997.

View us on the Internet. Our web site is <http://www.agric.gov.ab.ca/irrigate/index.html>.

For more information please contact Brian Taylor, Irrigation Branch, Alberta Agriculture, Food and Rural Development, Agriculture Centre, Lethbridge, Alberta, Canada. Telephone (403) 381-5542. ■

## Prairie Irrigation Symposium

**S**ponsored by the Prairie Provinces Irrigation Diversification Committee. To be held in conjunction with the Canadian Water Resources Association (CWRA) Annual National Conference in Lethbridge, Alberta, June 3rd thru 6th, 1997.

"A look at where the Canadian prairie irrigation industry has come from and the opportunities and challenges ahead, in a growing and diversifying agricultural economy." Please phone Wally Chinn at (403) 381-5864 for more information. ■

## Technical Conference

**T**he Annual Technical Conference for irrigation district management and engineering staff will be held on Friday, June 20, 1997 at Erickson's Family Restaurant. There is no theme as of yet, but keep the date in mind. Please phone Jack Ganesh at (403) 381-5869 for more information. ■



# Water Hauler's Bulletin Change

**W**ater Hauler's editor, Duncan Lloyd, has assumed new responsibilities with Alberta Agriculture, Food and Rural Development (AAFRD), animal industry division, aquaculture section and will no longer be the editor. Lloyd will now be responsible for province-wide managing and coordinating of AAFRD's new aquaculture section. The section will; license aquaculture facilities, provide extension services and accommodate industry's need for expanding food markets. As ocean fish stocks continue to decline opportunities avail themselves to inland aquaculture. It is going to be an exciting and challenging time to assist in this industry.

Lloyd, along with Jay Purnell and Jack Ganesh, who were the co-founders of the Water Hauler's in the fall of 1980, has been the editor since the spring of 1982, a span of 15 years.

I wish to thank the many contributors who willingly contributed articles for publication in the Water Hauler's over the years. I will sadly miss no longer being involved with the Water Hauler's but I know it will continue to be a good publication under the direction of Brian Taylor.

## Message from the New Editor

I was looking through some of the past issues of the Water Hauler's Bulletin, I discovered that this publication has been dedicated to the needs of those involved in the management and operation of Alberta's irrigation districts. It is my understanding that the first issue was distributed to less than 50 readers. Today's publication has a circulation of over 700, which includes subscribers in several countries throughout the world. During the recent AIPA conference I talked to many people about the future as well as the direction of the Water Hauler's Bulletin. In every instance I found that people were very pleased with the publication. The main thrust of the Bulletin will continue to emphasize that irrigation ideas and technology should be exchanged, while keeping in mind that some concepts may seem insignificant to some, often, will have significance to others.

I would like to congratulate Duncan on his new position and thank Bev McIlroy, who has been the

typist for the Water Haulers for the past 17 years. Arliss Boschee has now taken on her duties. ■

## THE WATER HAULER'S BULLETIN

Designed to provide the operation and management personnel of Irrigation Districts with items of interest in their line of work. Comments are welcome. Please contact Brian Taylor, editor, at Area Code (403) 381-5542, Lethbridge.

View the Water Hauler's Bulletin on Internet web site: <http://www.agric.gov.ab.ca/irrigate/hauler/index.html>

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